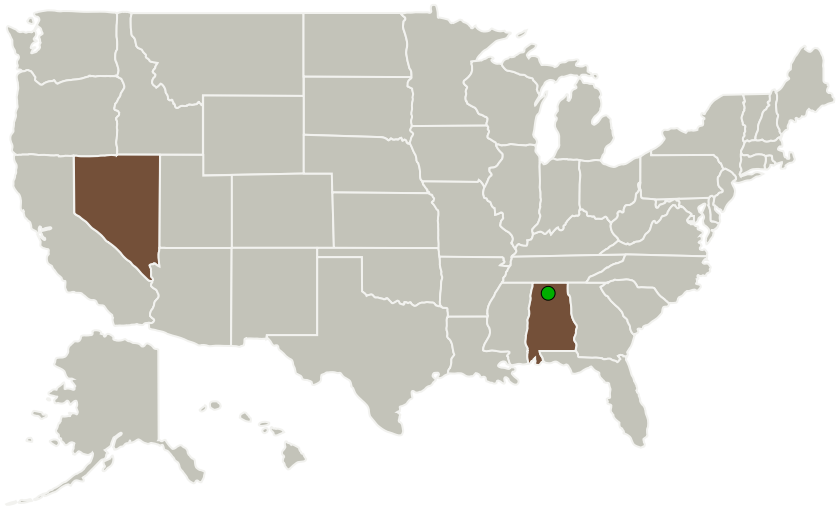
Green Electric Monopropellant (GEM) Fueled Pulsed Plasma Thruster, Phase I

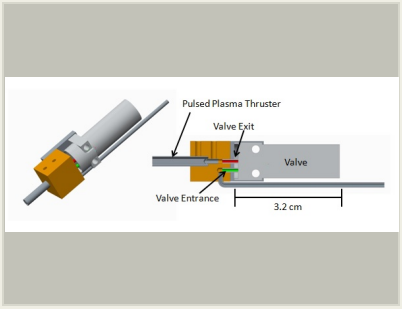
Completed Technology Project (2015 - 2015)

Project Introduction

Digital Solid State Propulsion is proposing the development of a new liquid Pulsed Plasma Thruster (PPT) using its revolutionary HAN-based Green Electric Monopropellant (GEM) to enable spacecraft missions whose fulfillment requires the high specific impulse of conventional Telfon-fueled PPTs, but would like the flexibility in mission design that liquid fueled systems allow. DSSP's GEM propellant is currently being developed as a chemical propellant whose density specific impulse is superior to any currently available monopropellant and is competitive with many state of the art bipropellants while remaining space-storable, has low toxicity and low sensitivity, and needs no bulky catalyst bed or long preheating to function. DSSP's solid propellant formulations have also demonstrated the ability to fire thrusters at up to 1,000 seconds of specific impulse when used as an electric propellant- the thrust versus specific impulse balance is determined by the amount and 'shape' of the electric power applied. DSSP intends to develop a PPT that can be commanded to fire at high specific impulse depending on mission requirements which is fed by plumbing and a fuel tank to enable more ambitious and more efficient missions for future satellites.

Primary U.S. Work Locations and Key Partners





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Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
Digital Solid State Propulsion Inc.(DSSP)	Lead Organization	Industry	Reno, Nevada
Marshall Space Flight Center(MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama

Primary U.S. Work Locations	
Alabama	Nevada

Project Transitions

June 2015: Project Start

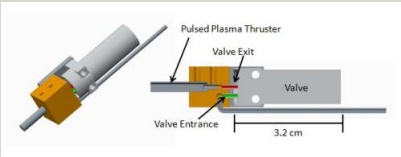
December 2015: Closed out

Closeout Summary: Green Electric Monopropellant (GEM) Fueled Pulsed Plasm a Thruster, Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image*(https://techport.nasa.gov/file/139028)*

Images



Briefing Chart Image
Green Electric Monopropellant (GEM) Fueled Pulsed Plasma Thruster, Phase I
(https://techport.nasa.gov/image/133374)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Digital Solid State Propulsion Inc. (DSSP)

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

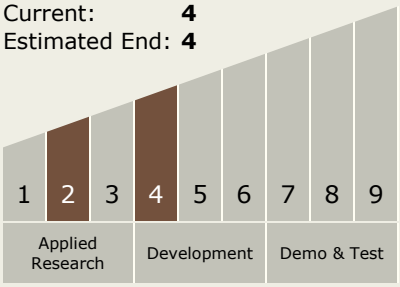
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Jason Thrasher

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX01 Propulsion Systems
  - TX01.1 Chemical Space Propulsion
    - TX01.1.4 Solids

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System